Seat No. : _____

LD-105

April-2014

B.Sc., Sem.-VI

CC-307 : Electronics

Time : 3 Hours] **[Max. Marks : 70**

Instructions : (1) **All** questions carry equal marks.
(2) Figures on the right indicate marks.
(3) Symbols have their usual meanings.

1. (a) Draw the circuit of fundamental log Op-Amp amplifier and obtain the expression for its output voltage. **7**

OR

Describe Op-Amp integrator and obtain the expression of its magnitude of gain. Also draw its frequency response.

(b) Describe inverting comparator. Draw its input and output waveforms for V_{ref} positive and V_{ref} negative. **7**

OR

Draw the circuit of regenerative comparator (SCHMITT TRIGGER) and explain it. Write the expression for lower thresh old voltage V_{LT}.

2. (a) Draw the circuit of edge-triggered phase detector and explain it. Draw its input/output waveforms. Show the variation of dc output voltage Vs phase difference ϕ. **6**

OR

Draw the block diagram of frequency multiplier using PLL and explain it.

(b) Draw the pin configuration and block diagram of voltage controlled oscillator (VCO) and explain it. Derive voltage to frequency conversion factor K_V. **8**

OR

Draw the pin configuration and the block diagram of IC PLL 565 and explain its operation. Obtain the expression for lock in range.

3. (a) Explain the construction and working of an SCR. **8**

OR

Draw the equivalent circuit of an SCR and explain its working from this equivalent circuit.

(b) Explain SCR full wave rectifier and obtain the expression for V_{av} and I_{av}. **6**

OR

Describe how SCR is used as a static contractor.

4. (a) Explain the construction and working of a triac. **8**

OR

Explain the construction and V-I characteristics of a diac.

(b) Describe how diac is used as a lamp dimmer. **6**

OR

How UJT is used as a relaxation oscillator ?

5. Answer in short : **14**

(1) Define capture range.

(2) What is the major difference between digital and analog PLL's ?

(3) List the basic building blocks of PLL.

(4) Which is greater capture range or lock in range ?

(5) What is comparator ?

(6) List different types of comparator.

(7) What is a window detector ?

(8) Which circuit is used to measure the phase angle between the two voltages ?

(9) What are the limitations of an ordinary Op-Amp differentiator ?

(10) Why SCR cannot be used as a bidirectional switch ?

(11) Define breakover voltage.

(12) Why are SCRs usually used in a.c. circuits ?

(13) What are the advantages of a triac over an SCR ?

(14) Why is diac used to trigger a triac ?
