Seat No. : 2339

AB-113

April -2018

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 side indicate marks.

(3) Symbols have their usual meanings.

1. (A) Explain in detail an application of OPAMP as a log amplifier using transistor in feedback section. Derive the equation for its output voltage. 7

OR

Explain application of OPAMP as a differentiator and integrator.

(B) Explain with the circuit diagram an inverting of Op-Amp comparator in which time varying signal is applied to inverting input and V_{ref} ($V_{ref} > 0$) is applied to the non-inverting input. Sketch input and output wave-forms with reference voltage. 7

OR

With the help of multiplier IC, explain to get

(i) Division of two input signals and

(ii) Square root of the given analog signal.

2. (A) Give the block diagram of IC 566 VCO and explain its operation. 7

OR

Draw the circuit diagram of a PLL AM detector and explain its operation.

(B) Draw exclusive – OR phase detector connection and logic diagram. Explain its operation with input and output waveforms. 7

OR

Explain the function of IC PLLs as frequency multiplier and divider.

3. (A) Draw the cross-sectional view of SCR. Explain the working of SCR by using two transistor analogy. 7

OR

Draw the circuit diagram of an SCR full wave rectifier. Explain its working and obtain expression for average output voltage and output current. 7

(B) Describe an application of an SCR as static contactor. 7

OR

Discuss V-I characteristics of an SCR. 7

4. (A) Draw circuit diagram of UJT relaxation oscillator. Explain its working and derive the expression of frequency of oscillation. 7

OR

Explain construction and working of Triac. 7

(B) Discuss V-I characteristics of Diac. 7

OR

Explain application of Triac as a motor speed controller. 7

5. Answer the following each question in **one** or **two** sentences : 14

(1) What will be the output voltage for antilog amplifier ? Given data : k = 1, V_{in} = 1 V, emf = 1 V.

(2) What is the major difference between digital and analog PLLs ?

(3) What is the range of modulating input voltage applied to VCO ?

(4) Why integrators are preferred over differentiators in analog computer ?

(5) Show the symbolic representation of the building blocks used in analog computers.

(6) What is 'PSRR' ?

(7) What do you mean by multiplier IC ?

(8) How can a Triac be triggered into conduction ?

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

(10) Define Holding current.

(11) For OPAMP comparator V_{NIV} = 10 mV, V_{NV} = 20 mV, supply voltage = 15 volt, then calculate V_{LOAD}.

(12) Write any two application of UJT.

(13) Name three thyristor devices.

(14) Why we do use silicon in SCR, not Germanium ?