

Seat No. : _____

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.

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

OR

Discuss V-I characteristics of an SCR.

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.

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

OR

Explain application of Triac as a motor speed controller.

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 ?