

Seat No. : \_\_\_\_\_

**AC-118**

**April-2015**

**B.Sc., Sem.-VI**

**ELE-307 : Electronics**

**Time : 3 Hours]**

**[Max. Marks : 70**

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

1. (a) Discuss fundamental log amplifier circuit using OPAMP and derive the equation of output voltage  $V_o$ . 7

**OR**

Explain how to get square and square root of a given analog signal.

- (b) Describe op-amp as an integrator. Also explain the frequency response of a basic integrator. 7

**OR**

Explain how comparator circuit is used as zero crossing detector, window detector and time marker generator.

2. (a) Describe the circuit of digital Ex-OR phase detector. Also draw its input/output waveforms. 7

**OR**

Discuss the application of PLL as a frequency multiplier and frequency translator.

- (b) Draw the block diagram of IC 566 VCO and explain its operation. 7

**OR**

Describe the circuit of Analog phase detector and explain its operation.

3. (a) Explain the working and V-I characteristics of an SCR. 7
- OR**
- Draw the circuit of SCR Half-wave rectifier and explain it. Obtain the expression for average voltage and average current.
- (b) Draw the equivalent circuit of SCR and explain its working from this equivalent circuit. 7
- OR**
- Describe how SCR is used as a static contactor.
4. (a) Explain the construction and working of a triac. 7
- OR**
- Describe some important applications of a triac.
- (b) Describe the operation and V-I characteristics of a diac. 7
- OR**
- Discuss UJT as a relaxation oscillator. Obtain the equation for frequency of saw-tooth wave.
5. Answer in **one** or **two** sentences. 14
- (1) Give the full form of PLL and VCO.
  - (2) What is the major difference between digital and analog PLLs ?
  - (3) List the basic building blocks of a PLL.
  - (4) Which is the feedback element in the integrator circuit ?
  - (5) What is comparator ?
  - (6) List the different types of comparator.
  - (7) Define capture range.
  - (8) Define breakover voltage.
  - (9) What are the advantages of SCR switch over mechanical switch ?
  - (10) Why SCR cannot be used as a bidirectional switch ?
  - (11) What are the advantages of a triac over an SCR ?
  - (12) Why is diac used to trigger a triac ?
  - (13) What is the most common application of diac ?
  - (14) Name three thyristor devices.
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