2807M093   Candidate's Seat No :_____

B.Sc. Sem.-6 Examination

CC - 307

Electronics

Time : 2-00 Hours]   July 2021   [Max. Marks : 50

Instructions: (1) All questions in Section-I carry equal marks
(2) Attempt any Three questions in Section – I.
(3) Question – 9 in section – II is compulsory

SECTION - I

Q-1 (A) Draw the circuit of Op–Amp log amplifier using transistor as feedback element and derive   7
necessary equation for output voltage.

(B) Describe the application of Op–Amp as an integrator and obtain expression of output   7
voltage. Also draw frequency response of the integrator circuit.

Q-2 (A) Describe the application of Op–Amp comparator as zero crossing detectors.   7

(B) Write a short note on regenerative comparator using Op–Amps.   7

Q-3 (A) Draw the block diagram of PLL and explain basic principle of PLL.   7

(B) Explain the application of EX–OR gate in digital phase detector.   7

Q-4 (A) Explain the application of PLL as AM detector   7

(B) Write a short note on Edge-Triggered phase detector using NOR gates.   7

Q-5 (A) Explain the working of SCR using two transistor analogies.   7

(B) Explain the terms used for SCR (1) PRV (2) holding current (3) forward current rating   7

Q-6 (A) Write a short-note on Forced commutation of an SCR.   7

(B) A half wave rectifier circuit employing an SCR is adjusted to have a gate current of 1mA.   7
The forward breakdown voltage of SCR is 100V for Ig=1mA. If a sinusoidal voltage of
200V peak is applied, find: (1) firing angle (2) conduction angle (3) average current.
Assume load resistance =100Ω and the holding current to be zero.

Q-7 (A) Explain the operation of TRIAC in different possible modes.   7

(B) Write a short note on TRIAC phase control circuit.   7

Q-8 (A) Explain the application of UJT in the relaxation oscillator.   7

(B) In a basic UJT relaxation oscillator circuit, R_1= 33Ω, R_2=330Ω, η=0.54, C=0.2μF, a   7
variable resistor R_E (between positive terminal of V_{in} and emitter) is used to change the
frequency of pulses delivered at V_{out}. The variable resister is initially set at 5kΩ and is then
adjusted to 10kΩ. Determine the frequency of the voltage spikes produced for (1) 5kΩ
setting and (2) 10kΩ setting.

SECTION - II

Q-9   Attempt ANY EIGHT. (Each question carry 1 mark)   8

1 What is 'virtual ground'?

2 Write the names of any two applications of analog multipliers?

PTO

3   Draw the basic circuit of voltage to current converter using Op-Amp.

4   Why temperature compensation is required for basic Op-Amp log amplifier?

5   Enlist any two applications of PLL?

6   Enlist any two building blocks of PLL.

7   What is the full form of VCO?

8   What is the function of LPF in PLL?

9   From which semiconductor, the SCR is made of?

10   Draw the symbol of SCR.

11   Write any one advantages of SCR as switch over a mechanical switch.

12   What is the full form of SCR?

13   How many semiconductor layers does the schematic of DIAC have?

14   What is the advantage of the TRIAC over the SCR?

15   How many junction/junctions a UJT has?

16   Draw the symbol of TRIAC.