1304E042

Candidate's Seat No :_____

B.Sc. Sem-6 Examination

CC 307

Electronics

April 2022

[Max. Marks : 50

ıe : 2-00 Hours]

Section – 1

(A) For the log amplifier using op-amp, prove that the output voltage is proportional to the logarithm of the input voltage. 7

(B) Write a short-note on op-amp differentiator. Draw sine and square waves and their differentiated forms. 7

(A) Write a short-note on op-amp integrator. 7

(B) Explain op-amp zero-crossing detector as an application of comparator. 7

(A) Draw the schematic block diagram of the PLL. Explain function of each block in detail. 7

(B) Write a short note on digital phase detector using Ex-OR gate. 7

(A) Describe the edge triggered phase detector using IC CD4001. 7

(B) Draw the PIN configuration and block diagram of NE/SE 566 VCO. Explain shortly the block diagram. 7

(A) Draw the V-I characteristics of an SCR. Explain forward and reverse characteristics in detail. 7

(B) Draw the equivalent circuit of an SCR and explain SCR's working from this equivalent circuit. 7

(A) Explain the terms break-over voltage, holding current, PRV and forward current rating as used in connection with SCR analysis. 7

(B) An SCR has a break-over voltage of 400 V, a trigger current of 10 mA and holding current of 10 mA. What do you infer from it? What will happen if gate current is made 15 mA? 7

(A) Discuss the construction of TRIAC in detail. 7

(B) Explain TRIAC operation with the help of suitable circuit diagram. 7

(A) Give the constructional details of the DIAC. Explain the operation of DIAC with the help of V-I characteristics. 7

(B) Write a short note on UJT relaxation oscillator. 7

Section – 2

Answer in short (ANY EIGHT): 8

1 Give the mathematical relationship between log_{10} X and *ln* X.

2 IC _____ is a typical four quadrant analog op amp multiplier.

3 Differentiation of a sine wave gives _____ wave and differentiation of square wave gives _____ wave.

4 For a lossy integrator circuit, the component values R1 = 10 kΩ, R_f = 100 kΩ, C_f = 10 nF, determine the lower frequency limit of integration.

5 What is the full form of PLL?

6 IC _____ is monolithic PLL available in 14 pin D-I-P package.

7 What is the function of the phase detector in the PLL?

8 Give any two medical instrumentation applications of VCO.

9 The free running frequency of a PLL is 300 kHz and the bandwidth of low pass filter is 10 kHz. Will the PLL acquire lock for an input signal of 320 kHz?

10 Write the full form of SCR.

11 Why SCR is called 'Thyristor' ?

12 Three terminals of an SCR are _____, _____ and _____.

13 An SCR in a circuit is subjected to a 50 Amp surge that lasts for 12 ms. Determine whether or not this surge will destroy the device. Given that circuit fusing rating is $90A^2s$.

14 Why TRAIC makes no mention of rectification in its name?

15 Draw the symbol of TRIAC.

16 For a UJT R_{B1}=6 kΩ and R_{B2}=4 kΩ, calculate the value of intrinsic stand –off ratio η.