



R20 Regulation

Subject code: 3P4DD

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)

B.Tech IV Semester Regular Examinations, July 2022

LINEAR IC APPLICATIONS

(ELECTRONICS & COMMUNICATION ENGINEERING)

Maximum Marks: 70

Date:28.07.2022 Duration: 3 hours

- Note: 1. This question paper contains two parts A and B.
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks

(10x2M=20 Marks)

- 1 A certain Op-Amp has an open-loop voltage gain of 1,00,000 and a common-mode gain of 0.25. Determine the CMRR and express it in decibels.
- 2 what is meant by slew rate in an op-amp?
- 3 What are the different types of three terminal voltage regulators?
- 4 Design a Schmitt trigger circuit with the following parameters: $UTP=LTP=1V$, $V_{cc}=\pm 15V$.
- 5 Explain the frequency response of phase shift between input and output voltage of an all-pass filter.
- 6 Draw the circuit diagram for the Wein Bridge oscillator.
- 7 List out the major blocks of the 555 timer functional diagram.
- 8 Write the expression of a) capture range and b) lock range.
- 9 Define the start of conversion and end of conversion in ADC.
- 10 Define Resolution.

Part-B

Answer All the following questions.

(10MX 5=50Marks)

- 11 Draw the block diagram of the IC 741 OP-AMP and explain its operation. [10M]
- OR
- 12 Explain about DC characteristics of OP-AMP. [10M]
- 13 Explain the working of Instrumentation amplifier with neat diagram. [10M]
- OR
- 14 Explain the V-to-I converter and I-to-V converter in detail with a circuit diagram. [10M]
- 15
 - A. Draw the neat circuit of the first-order low pass filter and describe it. [5M]
 - B. Design the low pass filter for 10 kHz frequency and pass-band gain of 15. [5M]
- OR
- 16 Design and draw the saw tooth wave generator using op-amp and explain its operation. [10M]

17 With a neat, functional diagram, explain the working of the 555 timer as a monostable multivibrator and derive an expression for the frequency of oscillation with relevant waveforms. [10M]

OR

18 Explain Block Diagram and Working Principle of PLL with Applications. [10M]

19 A.Explain the working principle of Dual slope ADC with a neat sketch. [5M]

B. Write short notes on the specification of ADC and DAC. [5M]

OR

20 Explain the operation of the 4-bit inverted R-2R ladder type of DAC in detail. If $R=R_f=10k\Omega$ and $V_R=12V$, find the resolution, I_{out} and total current delivered to the Op-amp and the output voltage when the binary input is 1011. [10M]