

Code No: 155SN

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, August - 2022

LINEAR AND DIGITAL IC APPLICATIONS

(Electrical and Electronics Engineering)

Time: 3 Hours

Max. Marks: 75

Answer any five questions  
All questions carry equal marks

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- 1.a) Describe the characteristics of an ideal op-amp. Give the practical op-amp equivalent circuit.
- b) Explain the working of instrumentation amplifier with suitable diagram.
- c) Explain the features of 723 voltage regulator. Mention its applications. [5+5+5]
- 2.a) Derive the expression for closed-loop gain for practical inverting op-amp.
- b) Explain the working of a Schmitt trigger with neat circuit diagram.
- c) List and explain the characteristics of three terminal IC regulator. [5+5+5]
- 3.a) Draw the 2<sup>nd</sup> order band pass filter and draw its frequency response in detail.
- b) Draw the functional block diagram of 565IC and explain its working. Define lock range, Capture range and free running frequency. [7+8]
- 4.a) Draw the circuit of a Op-amp based triangular-wave generator, explain its operation and derive expressions for frequency of oscillations.
- b) Design monostable multivibrator using 555 Timer to produce a pulse width of 100 m sec. [7+8]
- 5.a) Give the schematic circuit of integrating type A/D converter and explain the operation of this system and derive expression for output voltage  $V_o$ .
- b) What are the drawbacks of weighted resistor DAC? How they can be overcome by using R-2R ladder DAC. [9+6]
- 6.a) Draw the circuit diagram of dual slope ADC and explain its operation.
- b) An 8 – bit Digital – to – Analog converter produces 4V output as maximum analog signal. Compute the resolution of the converter. Define ‘Linearity’ of a DAC. [9+6]
- 7.a) Design a driving circuit for LED and which 74XX series IC is used for it?
- b) Design a 4 to 16 decoder using two 74×138 decoders. [8+7]
- 8.a) Explain the operation of synchronous 4-bit binary counter.
- b) Describe RAM Architecture and write its applications. [8+7]

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