

S.E. ECS/SE (I-IV)/R-19/S.H. 2024/04-12-2024  
Q.P. Code - 67083

Duration 3 Hours

Maximum marks 80

- 1) Question 1 is compulsory
- 2) Attempt any three from the remaining questions
- 3) All questions carry equal marks.
- 4) Assume suitable data if necessary.

- Q.1.** Attempt any **four** from the following questions
- a State and explain Miller's theorem 5
  - b Draw the functional block diagram IC 741 & explain the function of each block. 5
  - c Derive expression of voltage gain for inverting amplifier. 5
  - d Draw the circuit diagram and state the expression of RC phase shift oscillator 5
  - e State the Features of IC 555 Timer 5
- Q.2.a** Explain purpose of plotting frequency response of the amplifier. Sketch frequency response of RC coupled amplifier and Define Low, mid and high frequency regions and Bandwidth 10
- b** Compare voltage series, voltage shunt, current series and current shunt feedback amplifiers. 10
- Q.3.a** Draw the circuit diagram of basic MOSFET differential amplifier and explain its operation. sketch and explain its DC transfer characteristics. 10
- b.** State and explain operation and application of zero crossing detector 10
- Q.4.a** Define following parameters of OP AMP and state its ideal and practical value for IC 741. [i] Input offset [ii] CMRR [iii] Slew Rate [iv] Output resistance [v] Input bias current [vi] Differential mode gain 10
- b.** Draw the circuit diagram of differentiator using OPAMP and derive the expression of output voltage. State its applications. 10
- Q.5 a** Draw a neat circuit diagram using op-amp for deriving the function  $V_o = -(V_1 + V_2 + V_3)$  10
- b** Explain the working of Inverting Schmitt Trigger (regenerative comparator) and explain the working with proper transfer characteristics 10
- Q.6 a** With neat circuit diagram and waveform explain operation of Monostable multivibrator using IC 555 10
- b** Explain the circuit for square wave and triangular wave generator using OP-Amp 10

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