

SE Sem IV NEP-2020 May/June 2026

Duration: 2hrs

[Max Marks: 60]

- N.B. : (1) Question No 1 is Compulsory.
(2) Attempt any three questions out of the remaining five.
(3) All questions carry equal marks.
(4) Assume suitable data, if required and state it clearly.

- 1 Attempt all [15]
 - a Define low frequency response of a MOSFET amplifier. [3]
 - b State the principle of a differential amplifier. [3]
 - c Explain the concept of feedback in amplifiers. [3]
 - d List the conditions for sustained oscillations. [3]
 - e Give any three applications of op-amp or IC 555 timer. [3]
- 2 a Determine the lower cut off frequency due to the effect of coupling and bypass capacitors for an CS amplifier with the following specifications: [10]
 $V_{cc} = 15V$, $R_1 = 40K\Omega$, $R_2 = 10K\Omega$, $R_D = 3.3K\Omega$, $R_S = 2K\Omega$, $R_L = 2.2K\Omega$
 $CC_1 = 10\mu F$, $CC_2 = 1\mu F$, $C_S = 20\mu F$
 - b Explain what is a multistage amplifier? Explain the different types of coupling methods. [5]
- 3 a Describe the working of MOSFET differential amplifier [5]
 - b Summarize CMRR and input resistance of differential amplifiers. [5]
 - c Outline the characteristics of an ideal op-amp with reference to IC 741. [5]
- 4 a Explain different types of feedback and their effect on gain with help of diagram and derivation [10]
 - b Clarify the concepts of virtual ground and virtual short. [5]
- 5 a Describe Barkhausen's criterion and working of RC phase shift oscillator. [10]
 - b Explain square wave generators. [5]
- 6 Write a short note on:
 - a Op-amp as integrator & differentiator [5]
 - b Zero crossing detector [5]
 - c IC 555 timer in monostable mode [5]
